

**Case 3674*****Collohmanna* Sellnick, 1922 (Arachnida, Acari, Oribatida): proposed conservation by giving it precedence over the senior subjective synonym *Embolacarus* Sellnick, 1919**

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**Abstract.** The purpose of this application, under Article 23.9.3 of the Code, is to conserve the widely used oribatid mite genus name *Collohmanna* Sellnick, 1922, which is threatened by the obscure senior subjective synonym *Embolacarus* Sellnick, 1919. The latter is based on a single fossil species whose type and only known specimen is lost; most subsequent literature citations are simple, unenhanced listings. By contrast, *Collohmanna* has been used in a significant body of literature relating to morphology, reproductive biology, development, behavior, chemical ecology and phylogeny, as well as appearing in molecular databases. It is proposed that *Collohmanna* be given precedence over *Embolacarus* whenever they are considered to be synonyms.

**Keywords.** Nomenclature; taxonomy; Acari; Oribatida; COLLOHMANNIIDAE; *Collohmanna*, *Embolacarus*; oribatid mite; moss mite; Baltic amber fossil.

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1. The oribatid mite genus *Embolacarus* Sellnick, 1919 (p. 39) was proposed with *E. pergratus* Sellnick, 1919 (p. 39) as type species (by monotypy), on the basis of a single Baltic amber fossil. The latter is presumed lost following World War II, along with other types from that publication and the main part of the amber collection of Königsberg University (E.E. Ezhova, pers. comm., 2010; see also Ezhova, 1995; Sidorchuk & Norton, 2010). No specific family association was proposed in the original publication, *Embolacarus* has remained monotypic, and no further specimen has been reported in the literature (but see below). We have thoroughly examined the literature for usage of the name: Vitzthum (1931) assigned the genus to NEOLIODIDAE without comment (and subsequently expressed doubt in 1942, without explanation), and Dubinin (1962) reproduced Sellnick's (1919) original illustration of *E. pergratus*, listing the genus without comment. All other published citations of *Embolacarus* between its proposal and 2006 (see below) have been in secondary literature as bare, unelaborated listings in catalogues and other compilations (Radford, 1950; Baker & Wharton, 1952; Petrunkevitch, 1955; Keilbach, 1982; Krivolutsky et al., 1990; Fujikawa, 1991; Labandeira et al., 1997).



2. The extant oribatid mite genus *Collohmanna* Sellnick, 1922 (p. 18) was proposed with *C. gigantea* Sellnick, 1922 (p. 18) as type species by monotypy. A second species, *C. nova* Sellnick, 1932 (p. 704), was shown by Schuster (1962) to represent the male of the dimorphic *C. gigantea*, its senior subjective synonym. Three subsequent *Collohmanna* species were proposed: *C. asiatica* Krivolutsky & Christov, 1970 (in Christov, 1970), *C. schusteri* Norton, 2006 and *C. johnstoni* Norton & Sidorchuk, 2014, which are respectively extant, fossil (Baltic amber) and extant, such that *Collohmanna* currently includes four nominal species. No family association was proposed by Sellnick (1922), but subsequently the genus was included in several families by different authors (reviewed by Norton & Sidorchuk, 2014) before being used as type genus for the monogeneric family COLLOHMANNIIDAE Grandjean, 1958 (p. 118).

3. Norton (2006) identified probable inaccuracies in Sellnick's (1919) original description and illustration of *Embolacarus pergratus* and proposed its transfer to COLLOHMANNIIDAE. He discussed the possible synonymy of *Embolacarus* and *Collohmanna*, but postponed judgment until the species was rediscovered. One of us (EAS) recently found such a specimen in a private collection of Baltic amber in Hamburg (Thomas Weiterschan coll. #1710) and preliminary examination tentatively confirmed Norton's suspicions. We are in the process of writing a review of COLLOHMANNIIDAE that includes a redescription of *C. asiatica* and the proposal of several new species, both extant and fossil; in this work we also will redescribe *Embolacarus pergratus* and designate a neotype, and formally propose the synonymy of *Collohmanna* and *Embolacarus*. We will maintain usage of *Collohmanna* and explain our appeal to the Commission to reverse the precedence of the names, based on degree of usage.

4. Whereas *Embolacarus* appeared only in secondary literature listings after its original proposal (see above), research publications covering a wide spectrum of non-taxonomic topics have used the name *Collohmanna*: (a) Under this name the genus has been considered a primary candidate for sister-taxon of a major evolutionary radiation of oribatid mites, the hyporder Ptyctima (Štorkán, 1925; Grandjean, 1966, 1969; Travé, 1975; Norton & Sidorchuk, 2014). (b) Morphological and methodological studies using this name have demonstrated rarities including strong sexual dimorphism, atypical male genitalia, multiplicity of dermal glands with implications for the evolution of gland-seta associations, and numerous other unusual traits (Sellnick, 1932; Grandjean, 1934, 1966 and scattered details in many other papers as indicated by van der Hammen, 1976; Woodring, 1970; Alberti et al., 1994; Walzl, 1991; Alberti & Schuster, 2005; Norton & Sidorchuk, 2014). (c) Histological and ultrastructural studies using this name have revealed detailed aspects of digestive, excretory and reproductive organs, as well as spermatogenesis (Hoebel-Mävers, 1967; Woodring, 1973; Alberti & Schuster, 2005). (d) Developmental studies using this name have analysed ontogenetic transformations, including intricate patterns of setal additions (Grandjean, 1966; Pfungstl et al., 2005; Norton & Ermilov, 2014; Norton & Sidorchuk, 2014). (e) Under this name *C. gigantea* was shown to be an experimental intermediate host for tapeworms (Ebermann, 1979). (f) Ethological studies using this name have demonstrated behavioral rarities among oribatid mites, including associative courtship and the use of self-produced nuptial food by males to entice females (Schuster, 1962; Grandjean, 1966; Alberti & Schuster,



2005; Behan-Pelletier & Eamer, 2010; Norton & Sidorchuk, 2014). (g) The type species, *C. gigantea*, is the first oribatid mite whose chemical ecology was studied. Its opisthonotal glands produce a wide variety of organic compounds that serve several defensive functions against predators and other antagonistic organisms, and it has been a model for similar studies of other oribatid mite species (Raspotnig, 2006; Raspotnig et al., 2001, 2003, 2004; Raspotnig & Foettinger, 2008). Also, it is among the few oribatid mites whose cuticular fatty acids have been studied (Raspotnig & Krisper, 1998). (h) All relevant molecular data available in Genbank are under the name *Collohmanna*, including those derived from studies of oribatid mite phylogeny and convergence in morphological defensive structures (Lee et al., 2006; Dabert et al., 2010; Pahl et al., 2012).

5. The name *Collohmanna* is also applied throughout the relevant taxonomic literature. It was used in the proposal of four species subsequent to 1922 and it appears in all taxonomic checklists, catalogues, monographs and other compilations published since 1922 that have pertinent geographical coverage of extant oribatid mites. Important examples include: Vitzthum (1931, 1942); Grandjean (1954, 1969); Tarman (1958, 1970, 1983); Schuster (1960, 1965); Sellnick (1960); Balogh (1961, 1963, 1965, 1972); Mihelčič (1965); Kunst (1971); Krivolutsky & Tarba (1972); Bulanova-Zachvatkina (1975); Mahunka (1977); Hammer & Wallwork (1979); Balogh & Mahunka (1983); Schatz (1983); Karppinen et al. (1986, 1987, 1992); Marshall et al. (1987); Fujikawa (1991); Balogh & Balogh (1992); Flogaitis, (1992); Vasiliu et al. (1993); Sergienko (1994); Krivolutsky et al. (1995); Murvanidze & Daredzhanashvili (2000); Starý (2000); Shtanchaeva (2001); Ryabinin & Pan'kov (2002); Woas (2002); Mahunka & Mahunka-Papp (2004); Subías (2004); Weigmann (2006); Melamud (2008); Norton & Behan-Pelletier (2009); Schatz & Schuster (2009); Shtanchaeva & Subías (2010); Subías et al. (2012); Lebedeva & Poltavskaya (2013) and Mahunka et al. (2013).

6. Further, the name *Collohmanna* has been used in many secondary citations of the papers indicated in paras. 4 and 5 (above). We do not attempt to list these here, other than to note that the name was used in all the relevant general texts on acarology (e.g. Baker & Wharton, 1952; Krantz, 1978; Evans, 1992; Alberti & Coons, 1999; Walter & Proctor, 1999, 2013; Krantz & Walter, 2009). As they have no significant economic or health importance, oribatid mites in general are little cited in the literature, but, relative to *Embolacarus*, the use of *Collohmanna* is much greater in both topical and quantitative senses.

7. Based on the Principle of Priority (Article 23.1), *Embolacarus* Sellnick, 1919 would be a senior subjective synonym of *Collohmanna* Sellnick, 1922. While the former is poorly known and little used, its continued appearance in checklists and catalogues, particularly ones listing fossil mites, precludes our application of Article 23.9.1.1. Therefore, in the interest of nomenclatural stability, we request that the Commission uses its plenary power to apply Article 23.9.3, reversing the precedence of *Embolacarus* and *Collohmanna* and thereby allowing conservation of the much better-known name by the same author when the names are considered synonyms.

8. The International Commission on Zoological Nomenclature is accordingly asked:

- (1) to use its plenary power to give the generic name *Collohmanna* Sellnick, 1922 precedence over *Embolacarus* Sellnick, 1919, whenever the two names are considered to be synonyms;



- (2) to place on the Official List of Generic Names in Zoology the following names:
- (a) *Collohmanna* Sellnick, 1922 (gender: feminine), type species by monotypy *Collohmanna gigantea* Sellnick, 1922, with the endorsement that it is to be given precedence over *Embolacarus* Sellnick, 1919, whenever they are considered to be synonyms, as ruled in (1) above;
  - (b) *Embolacarus* Sellnick, 1919 (gender: masculine), type species by monotypy *Embolacarus pergratus* Sellnick, 1919, with the endorsement that it is not to be given priority over *Collohmanna* Sellnick, 1922, whenever they are considered to be synonyms, as ruled in (1) above;
- (3) to place on the Official List of Specific Names in Zoology the following names:
- (a) *gigantea* Sellnick, 1922, as published in the binomen *Collohmanna gigantea* (specific name of the type species of *Collohmanna* Sellnick, 1919).
  - (b) *pergratus* Sellnick, 1919, as published in the binomen *Embolacarus pergratus* (specific name of the type species of *Embolacarus* Sellnick, 1919).

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